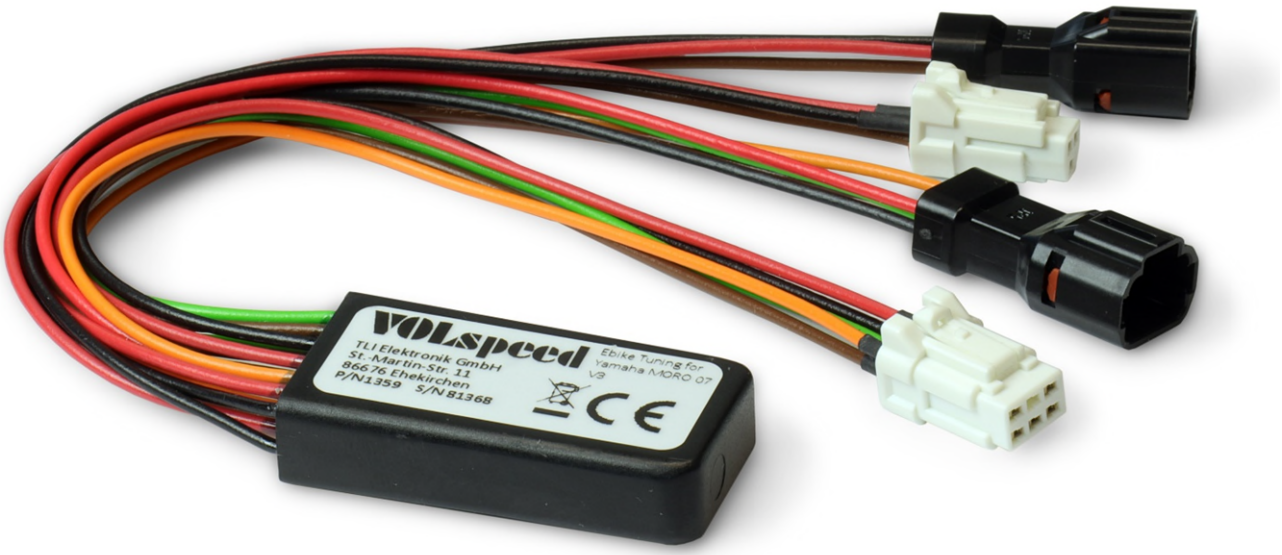
VOLspeed Ebike Tuning

Yamaha MORO 07

V3

Operating instructions

as original operating instructions in English language



1 General information

- Be sure to take the time to read these operating instructions carefully **before** starting to install the tuning module.
- Keep these operating instructions in a safe place, yet within easy reach, so that you always have access to the important and safety-relevant information for use, even after installation.
- Make these operating instructions available for reading to any other person who may ride your tuned e-bike.
- Ensure that every person who is allowed to ride your tuned e-bike has read and understood these operating instructions before any use.
- Instruct the user in the safe use of the tuned e-bike with the aid of these operating instructions before leaving your tuned e-bike to other persons.
- Be sure to pass this manual on to the future owner if you ever want to sell the tuning module or your tuned e-bike.

1.1 Safety instructions

The warnings used in these instructions draw your attention to possible dangers. You endanger yourself and others if you do not follow these instructions. Serious injuries or considerable damage to property may result.
Warning notices are available in the following categories:

⚠ WARNING
Warns you of hazards that could result in fatal or serious injury to persons if you do not follow these instructions.

⚠ CAUTION
Warns you of hazards that may result in minor, usually reversible injury to persons if you do not follow these instructions.

ATTENTION
Warns you of situations that can lead to property damage and malfunctions during use if you do not follow these instructions.

IMPORTANT
Identifies safety-relevant descriptions and instruction parts.

2 Requirements for safe use

2.1 Intended use

The tuning module shifts the cut-off threshold of the motor support of your e-bike. Thus, with the installation of the tuning module, speeds of up to 45km/h (28mph) can be achieved with electric motor support.

Intended use also includes compliance with all of the following without exception

- Restrictions on use and
- Installation requirements and the
- Obligations of the owner and the user.

2.2 Restrictions on use

The following restrictions of use are associated with the installation of the tuning module in your e-bike.

2.2.1 Do not use in public areas

E-bikes for use on public roads or public ways with a permitted speed of > 25 km/h are subject in the EU to Regulation 168/2013/EU, the Vehicle Regulation. Further approval requirements in non-European countries may apply. The purchase of the Tuning Module does not entail any approval for operation in public areas. Therefore, participation in public road traffic and driving on public roads is prohibited after installation of the tuning module.

IMPORTANT **Prevent misuse and abuse**

- ► Only use your tuned e-bike on private, secured property or race tracks.
- ► Never ride on public paths or areas that you have not previously been able to securely block off against entry by other persons.
- ► Also prevent another person from using your tuned e-bike in public traffic or on public roads.
- ► Always lock your tuned e-bike when you park it. This will prevent misuse and abuse, even by other people.

2.2.2 Restricting the circle of users

Reaching higher speeds can lead to the permissible group of users determined by the e-bike manufacturer having to be further restricted.

Such a restriction must be determined by the owner of the tuned e-bike on his own responsibility, taking into account the physical and mental fitness of the persons to whom the tuned e-bike is made available for use.

IMPORTANT **Prevent misuse and abuse**

- ► Clearly define the permission for use before each transfer to other persons.
- ► Also clearly define the terrain to be covered.

- Always lock your tuned e-bike when you park it. This will prevent misuse and abuse by other people.

2.2.3 Observe shortened maintenance and inspection intervals

Due to the higher speeds with electric motor assistance, higher loads and forces will act on all vehicle parts.
Reaching higher speeds increases wear on all vehicle parts, especially the brake system and all parts of the drive system, even with suitable strength and design of the vehicle.

IMPORTANT

Define shortened maintenance and inspection intervals

Shortened inspection and maintenance cycles must be determined by the owner of the tuned e-bike on his own responsibility, taking into account the conditions of use.

- Before each use of your tuned e-bike, perform a comprehensive inspection of the vehicle.
- It is imperative that you check the condition and function of the
  - brakes and their functional components,
  - vehicle frame,
  - steering system and its functional components,
  - drive system and its functional components as well as
  - saddle and its functional components.
- In addition, observe all inspections not mentioned here that are prescribed by the manufacturer of your e-bike before each use. This list does not replace the original operating instructions of the e-bike manufacturer.
- Establish further inspection and maintenance cycles according to the manufacturer's instructions for your e-bike.
- Shorten them according to your operating conditions.
- If necessary, coordinate this with your specialist company, which will carry out the inspection and maintenance work.

This ensures that the shortened inspection and maintenance intervals are adhered to.

2.3 Know and comply with installation requirements

For safe use of the tuning module in your e-bike, your e-bike must also meet some requirements.

2.3.1 Requirements for the strength and construction of the e-bike

Strength and construction requirements are regulated by EN 15194 and EN ISO 4210-2 and must be confirmed as applied by the manufacturer of your e-bike.

⚠ WARNING **Prevent increased accident risks due to insufficient strength**

Due to the higher speeds with electric motor assistance, higher loads and forces will act on all vehicle parts. Increased accident risks due to part breakage and part failure can only be largely ruled out with e-bikes that are demonstrably designed and built in accordance with both product standards.

- Check the EC declaration of conformity of the manufacturer of your e-bike.
- Only install the tuning module in your e-bike if the manufacturer of your e-bike states the two product standards EN 15194 and EN ISO 4210-2 as applied in its EC declaration of conformity.
- Only if both standards are mentioned as applied, it can be assumed that the requirements for strength and design are fulfilled.
- Never use the tuning module in vehicles for which you cannot clearly establish these requirements and prove them by means of the EC declaration of conformity from the e-bike manufacturer.

IMPORTANT **Racing e-bikes, city e-bikes or trekking e-bikes are usually not equipable**

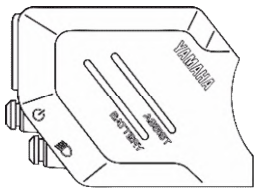
Racing e-bikes, city e-bikes or trekking e-bikes often do not meet the requirements for strength and construction, as lower requirements apply to these types of e-bikes. Furthermore, it cannot be assumed that these e-bikes are actually only used on private, secured properties or race tracks.

2.3.2 Check and confirm drive system and display requirements

The tuning module is adapted to specific drive systems and display types.

- Check the equipment of your e-bike.
- The tuning module only works with e-bikes that have an electric motor support of up to 25km/h ex works. Children's e-bikes with a support up to 20km/h and Speed-e-bikes with a support up to 45km/h are not supported.
- Only install the tuning module into your e-bike if you can determine that your e-bike equipment matches the drive systems and display types listed below.

drive system:	Display type:
Yamaha - PW-X3 (MORO 07 only)	Interface X



Interface X

Compatibility

This tuning module is only compatible with the YAMAHA MORO 07 e-bike.

IMPORTANT **Prevent damage and malfunctions**

Use in vehicles with unsuitable drive systems and/or display types will lead to malfunctions or damage to the e-bike or the tuning module.

2.4 Obligation of the owner

Any user of the tuned e-bike must be instructed accordingly by the owner of the tuned e-bike on the basis of these operating instructions, as well as being informed about the special restrictions on use and increased risks due to the increased speed.

The owner of the tuned e-bike ensures that

- all requirements for safe use
- and for the intended use are complied with, and
- these operating instructions are always available to every user.

The owner of the tuned e-bike undertakes to only make the tuned e-bike available to persons who

- have read and understood these operating instructions and
- have been instructed in the safe and proper use of the tuned e-bike.

2.5 Obligation of each user

Every user is obliged,

- to read and observe these operating instructions in full, and
- to follow all safety and warning instructions without exception,
- to use the tuned E-bike only in technically perfect condition and in accordance with its intended purpose, in a safety-conscious and hazard-conscious manner and in compliance with these operating instructions and
- to remedy immediately any damage or malfunctions detected which could impair safety, or, if necessary, to have them remedied.

3 Warranty and liability

3.1 Warranty and liability of the tuning module manufacturer

Warranty and liability claims are excluded by the manufacturer of the tuning module in the event of direct or indirect personal injury or damage to property if they are attributable to one or more of the following causes:

- Increased wear or breakage of components of the e-bike, especially parts of the brake system and/or the drive system,
- non-observance of these operating instructions,
- improper use of the tuning module or the e-bike with integrated tuning module,
- non-observance of the operating restrictions of these operating instructions,
- use or operation with operating conditions that do not comply with these operating instructions,
- improper installation, commissioning, maintenance or repair not specified in these operating instructions,
- after unauthorised structural, hardware or software modifications to the tuning module itself or to the e-bike approved for the tuning module or its equipment.

IMPORTANT **The installation and operation of the tuning module is at your own risk.**

- The manufacturer of the tuning module does not accept any liability for damage related to the operation or installation of the tuning module.
- The technical and legal consequences mentioned may be incomplete.
- In addition to the technical and legal consequences mentioned in these operating instructions, further requirements may apply depending on the place of operation.
- Before installing the device, inform yourself about possible further technical and legal consequences and requirements that you must comply with in order to operate the tuned e-bike.

3.2 Warranty, guarantee and liability by the manufacturer of the e-bike

Due to the higher speeds with electric motor assistance, higher loads and forces will act on all bicycle parts.

Reaching higher speeds increases wear on all bicycle parts, especially the braking system and all parts of the drive system, even if the vehicle is of suitable strength and design.

For this reason, liability, warranty and guarantee claims against the dealer or manufacturer of the e-bike will expire or be severely limited with the use of the tuning module.

3.3 Property damage and personal injury - Further exclusions of liability to be considered

An e-bike can reach electric motor-assisted speeds of up to 45 km/h after the tuning module has been installed. Reaching such speeds increases the risk of a fall and resulting injury, even with

suitable strength and design of the vehicle. It also increases the risk of damaging other people or property.

ATTENTION **Reduce increased liability risks**

- Precisely define your operating conditions and user groups to be insured.
- Take out liability insurance appropriate to the conditions of use and the user group for the use of your tuned e-bike.

⚠ WARNING **Reduce increased risk of hazards**

- Always wear suitable protective clothing and a helmet while using your tuned e-bike to protect yourself from increased risk of accidents.
- Insist that every user of your tuned e-bike wears appropriate protective clothing and a helmet at all times during use.

ATTENTION **Reduce the risk of accidents monetarily**

- Precisely define your operating conditions and user groups to be insured.
- Take out an insurance policy for the use of your tuned e-bike that is appropriate to the conditions of use and the user group.

4 Functional description

The tuning module offers the following functions after installation in a Yamaha MORO 07 (25 km/h):

- Regulation speed adjustable up to 45 km/h (28mph) via control unit on the e-bike
- Adjustable dynamic mode, reduced "wall effect"

Additionally with existing display (ANT+ LEV):

- Correct display of speed and distance traveled
- Correct total mileage after removal of the tuning module
- Optimized range calculation with active tuning

Setting options

All settings are made via the control unit on the e-bike.
No smartphone or notebook is required.

Protected electronics

The electronics are encapsulated in the housing and thus reliably protected against moisture.

Safety and protective equipment

The safety and protective devices of the pedelec remain unaffected by the installation of the tuning module.

5 Technical data

Housing dimensions:	37mm x 19mm x 9mm (1.46” x 0.75” x 0.36”)
Cable length:	Approx. 140mm (5.5”)
Weight:	0.025kg (0.9oz)
Power consumption:	0.1W
Supply voltage:	5VDC

6 Installation

IMPORTANT **Before you start with the installation**

Confirm that you have read and understood all previous chapters of these operating instructions carefully and completely before you start the installation. This is the only way to ensure that you use the tuning module exclusively for the purpose described in these instructions and as intended.
The installation described below and all associated instructions refer to the installation example: Yamaha Moro 07, model year 2023 with PW-X3 motor.

Other e-bike models
For other e-bike models, the installation may differ slightly from the installation example.

6.1 Required tools

- Allen key 2mm / 8mm

6.2 Note part number and serial number

For support requests

- Make a note of the
  - Part number (P/N) and
  - Serial number (S/N) of the tuning module on the back of these operating instructions.

This way, you always have the data at hand for possible support requests.

6.3 Remove covers

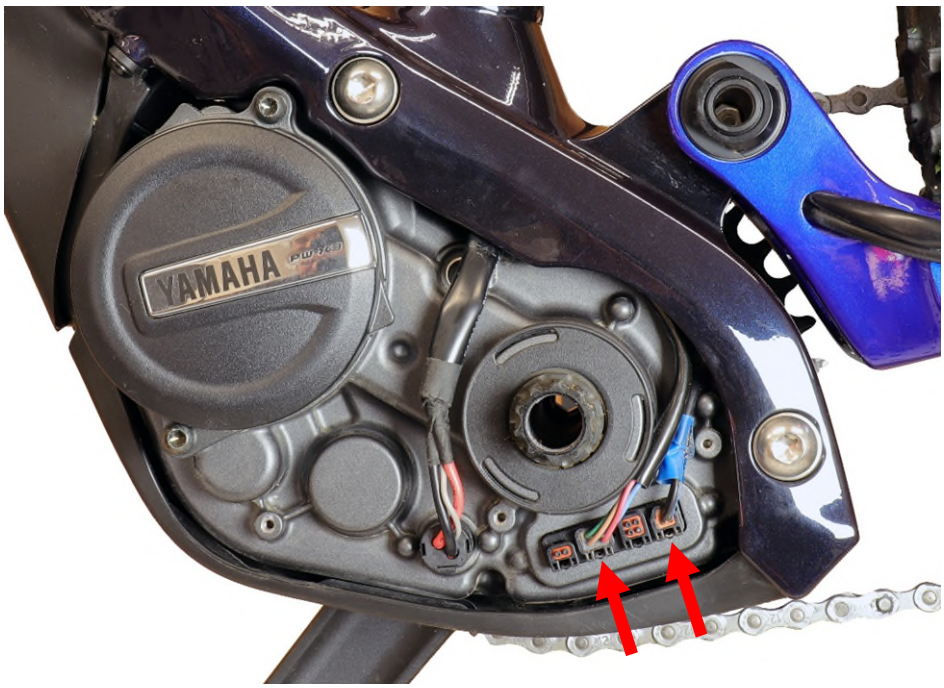
WARNING **Prevent unexpected startup**

If the drive starts unexpectedly, hands and fingers may shear, crush or retract. Switch off the e-bike. This will prevent any movement assisted by the electric motor.

- Ensure that your e-bike stands firmly and securely.

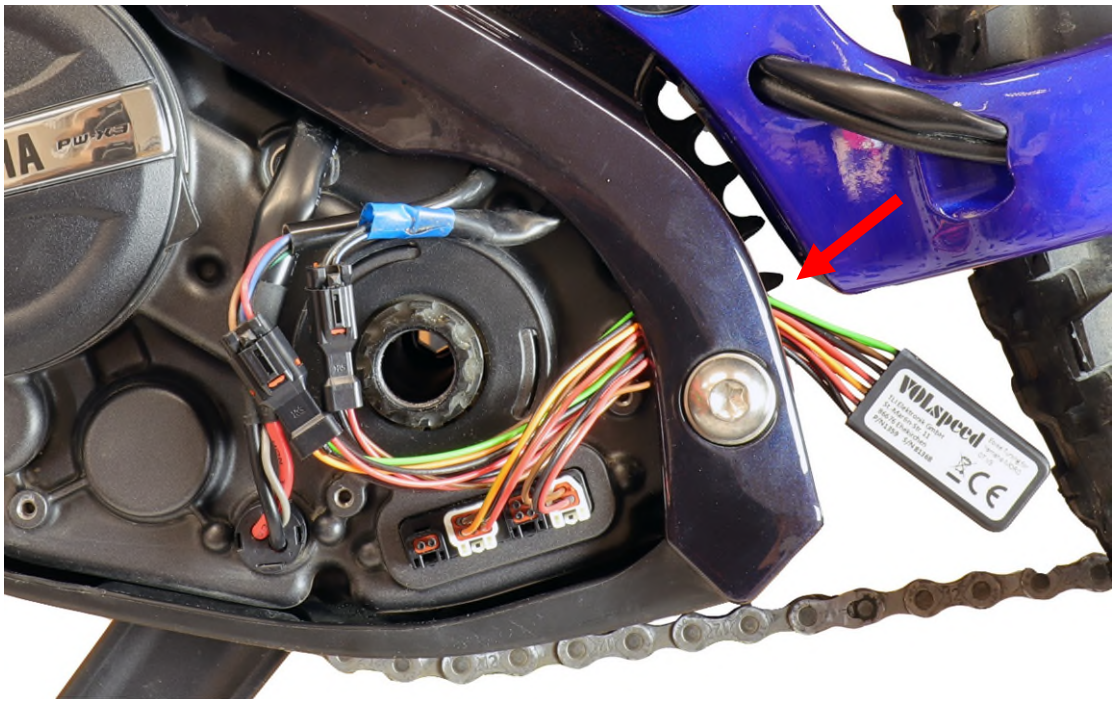
- Optional: Remove the left crank using an Allen key 8mm (1).
- Remove the screws (2) from the left motor cover and remove it.

Removing the crank
The left motor cover can also be removed without taking of the crank. This step is therefore optional.



- Disconnect the cables from the two marked sockets on the motor.

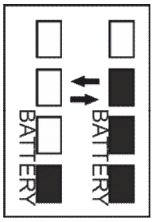
6.4 Connect the cables



- Guide the tuning module cables from the rear through the frame to the motor (red arrow).
- Plug the tuning module into the two free sockets on the motor.
- Also connect the two previously disconnected cables to the tuning module.

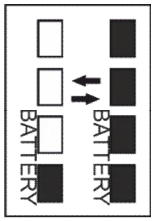
6.5 Check function

- Switch on the e-bike. Automatic initialization is carried out the first time it is switched on.



During initialization, one and three LEDs on the battery display flash alternately for about 20 seconds. As soon as the flashing stops, initialization is complete.

Initialization faulty



If the flashing does not stop after 20 seconds and instead one and four LEDs flash alternately, the initialization was faulty. Please check the wiring again carefully.
You can restart the initialization by switching the bike off and on again.

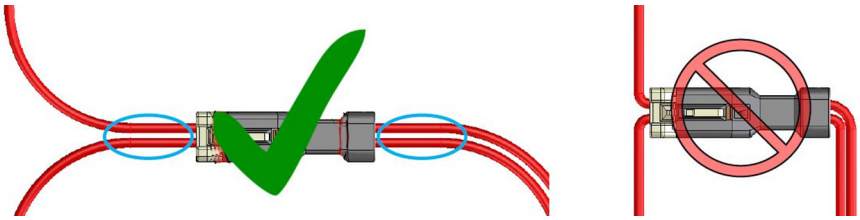
- Then check whether you can switch on the speed mode as described in chapter 7.
- Switch the e-bike off again .

6.6 Finalize installation

► Place the tuning module and the connectors in a suitable location, for example in the cavity above the motor.

ATTENTION **Ensure tightness of the connectors**

If possible, do not bend the cables directly behind the plug connector, as this could cause the seal on the plug connector to lose its effectiveness. This can allow moisture to enter the connector and cause damage. It is also advisable to place the connectors in an area that is protected from moisture as far as possible.

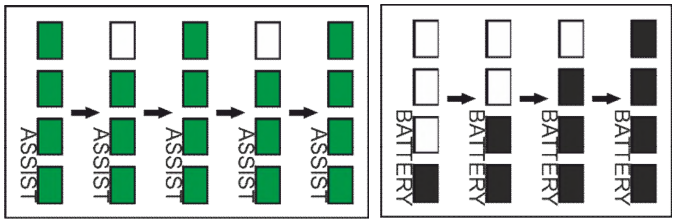


- Lay the cables so that they are not crushed when fitting the covers.
- Reattach the motor cover using the screws (2) .
- Refit the pedal crank (1).

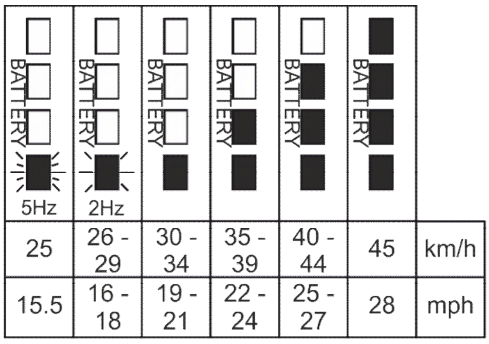
7 Speed mode

When speed mode is activated, the speed limit for motor assistance is raised. The limit can be freely set in the range of 25 to 45 km/h. Speed mode is automatically switched off when the e-bike is switched off and must therefore be reactivated when the bike is switched back on.

7.1 Switch on

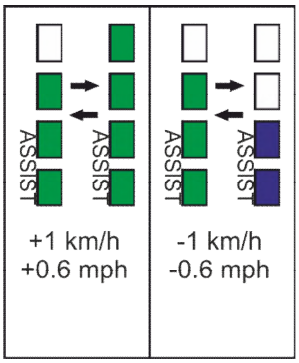


Use the arrow keys to change the assistance levels (Assist) as shown. The battery indicator acknowledges the input by the LEDs lighting up in quick succession.



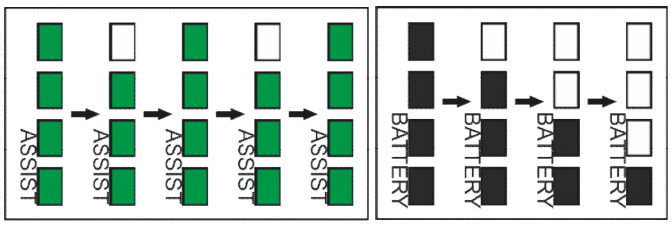
25	26 - 29	30 - 34	35 - 39	40 - 44	45	km/h
15.5	16 - 18	19 - 21	22 - 24	25 - 27	28	mph

The speed limit is then symbolized for 5 seconds via the battery indicator. Default value: 32km/h (20mph). Possible values: 25..45km/h (15.5..28.0mph). The speed mode is now switched on.



The limit can be changed by switching back and forth between the levels shown. The set value is saved as soon as you do not press a button for 5 seconds.

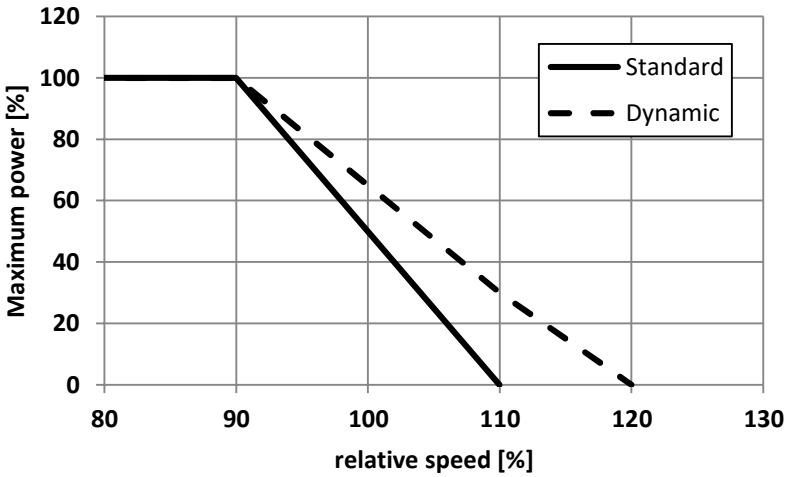
7.2 Switch off

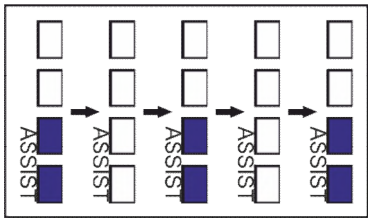


Use the arrow keys to change the assistance levels as shown. The battery indicator acknowledges the input by the LEDs going out quickly one after the other. Speed mode is off.

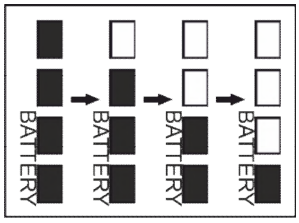
8 Dynamic mode

If the speed limit is exceeded, the motor power is greatly reduced as standard. A higher pedal force then initially no longer results in a higher speed, but in less motor assistance. For a more natural riding experience, the speed reduction is spread over a wider speed range in dynamic mode, reducing the so-called "wall effect".

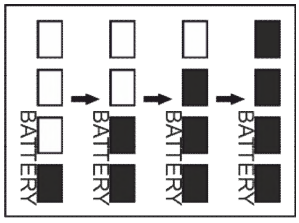




When speed mode is activated, use the arrow keys to change the assistance levels as shown.



Dynamic mode off: The battery indicator LEDs go out quickly one after the other.



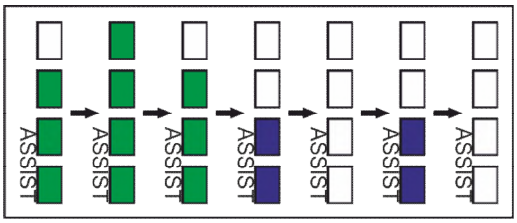
Dynamic mode on: The LEDs on the battery indicator light up in quick succession.

9 Restore factory settings

The tuning module sets itself up automatically. A conversion to another bike or another display is also recognized automatically. Nevertheless, it is possible to reset the tuning module to the factory settings. The following values are reset:

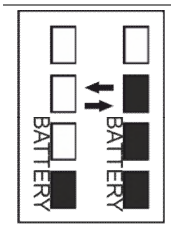
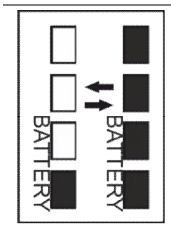
- The limit is set at 32 km/h.
- The mileage and wheel circumference are taken from the motor.

To restore the factory settings, first activate speed mode and then enter the following sequence quickly using the arrow buttons:



10 Status display

Certain operating states are symbolized by the tuning module by changing the battery indicator to inform the user.

Battery indicator	Meaning
	Initial initialization in progress. The value is displayed for 10 seconds after switching on for the first time or after resetting to factory settings.
	Speed sensor signal faulty. Check wiring.

11 FAQ

Why can't the limit be adjusted when activating speed mode?

To adjust the limit, it is not sufficient to press the up or down arrow button. To increase the limit, you must switch back and forth between the STD and HIGH levels. Each time you switch from STD to HIGH, the limit increases by one km/h. To reduce the limit, you must switch back and forth between the STD and ECO levels. Each time you switch from STD to ECO, the limit is reduced by one km/h accordingly.

Is the total mileage still correct after removing the module?

Yes, the total kilometers measured by the motor control unit are not changed by the tuning. This is ensured by a compensation function in the tuning module that works continuously in the background. However, before removing the module, the bike should be left at a standstill with speed mode switched on until it switches off automatically. This ensures that the compensation function has correctly adjusted the mileage.

What should I bear in mind when using a display?

Displays that support the ANT+ standard can optionally be connected to the Inteface X. The tuning module automatically ensures that correct values are transmitted to the display even when the tuning module is activated. In particular, the values for mileage, speed and range are corrected by the tuning module.

Technical support

If you have any questions or problems, please contact us by e-mail or telephone at:
TLI Elektronik GmbH
St.-Martin-Str. 11
D-86676 Ehekirchen
info@volspeed.de

Tel.: +49 (0) 8253 / 9279902

In addition to your request, please provide the following information:

- Article number and serial number of the unit (S/N, P/N)
- Bicycle manufacturer, type and model year
- Display type (e.g. Display A)
- Motor type (e.g. PW-X3)

To ensure that you always have the unit data at hand, you can enter it here before installing the unit:

Part number (P/N): _____

Serial number (S/N): _____

Waste disposal

Electronic devices are recyclable materials and do not belong in household waste.

At the end of its service life, dispose of the product in accordance with the applicable legal requirements.